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Mr. John J. Gerig
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Build Your Own TELEVISION RECEIVER*

Complete Construction Details for a TV Receiver That Covers all Channels From 44-88 mc.

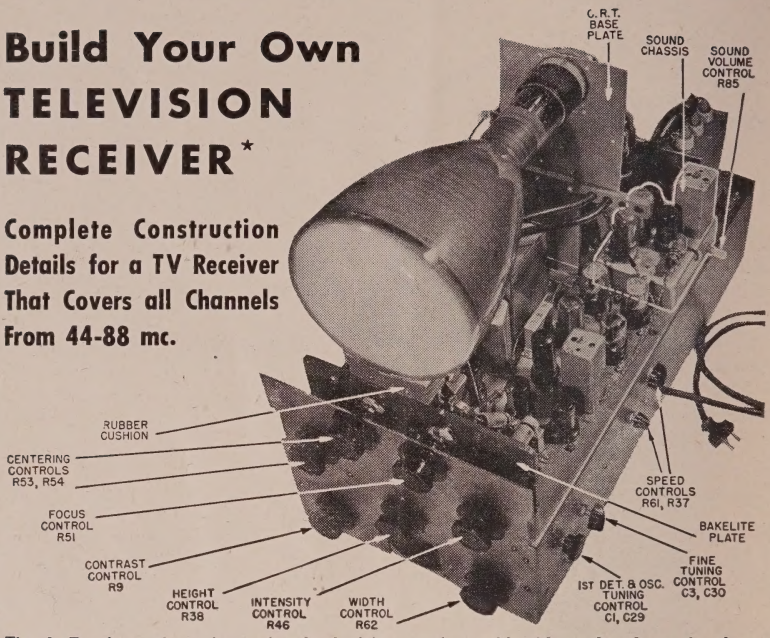


Fig. 1. Top-front view of completed television receiver with video tube shown in place. This unit has been converted from a war surplus type BC-412 oscilloscope. Many of the original components used in the oscilloscope are utlized in this set.

The techniques used in constructing and servicing television receivers are far removed from those used for AM receivers. Because television receivers are comprised of various intricate circuits it should be borne in mind that in order to successfully construct the unit described in this article one should have had some previous practical experience in the construction of radio equipment.

An excellent home television receiver can be constructed from the principal parts, tubes, and chassis of a low-cost, war-surplus oscilloscope; the type BC-412.

The completed television set has a 5-inch picture tube, self-contained high-voltage and low-voltage power supplies, and a video and sound circuit that is efficient and modern in every respect. Following the first detector stage are four sound stages feeding a PM speaker and five video stages feeding the grid of the cathode-ray tube. Necessary horizontal and vertical sync and control voltages for the picture tube are supplied by conventional circuits.

Using the easily obtained BC-412 war-surplus oscilloscope as the *basis* for this television receiver, actual cost of conversion is remarkably low, because the normally expensive components—used in the power supplies—are included in the complete oscilloscope unit.

The required scope is an Army Signal Corps type—numbered either BC-

* *By Leon S. Wecker and Tom Gootee in "Radio News."*

412-A or BC-412-B—easily recognizable by its large steel cover and by its excessive weight. It was originally used with the *first* mass-produced Army radar set (the SCR-268), but is now available at a very nominal price through most radio firms dealing in surplus war equipment.

However, the BC-412 scope selected for conversion *must* be equipped with a type 5BP4 cathode-ray tube. Some of the available surplus scopes have a tube with a greenish-tinted screen which is *not* satisfactory for video reproduction.

This television receiver, designed by Leon S. Wecker, W2FZR, may also be constructed, in the same manner described, using standard parts and components purchased individually. Circuit arrangement and wiring should be relatively the same as shown in accompanying illustrations. The process may be tedious, however. The simplest method of construction is to buy a surplus BC-412 scope and perform the conversion according to these instructions.

In performing any work, adjustment, or repair of television sets and circuits, *always take proper safety precautions!*

Operating voltages often are as high as several thousand volts. Use tools that are well insulated. Avoid direct contact with any part of a television circuit! Even when the set is turned off, exercise extreme care, since the circuits contain high-voltage condensers that may still be charged.

Whether the set is off or on, don't take chances with high voltage! Death hides in small wires and innocent looking components!

Preparing the Chassis

First step in converting the BC-412 scope is to remove the heavy steel case or cover. Then unscrew and remove the four handle brackets on the chassis.

Examine the main components above and below the chassis, and become familiar with their location and appearance, especially parts associated with the power supplies. A circuit diagram of the scope is glued to the shield surrounding the cathode-rav tube, and this diagram can be used to identify parts and components.

Remove all tubes from their sockets, taking care in handling the type 5BP4 cathode-ray tube and its round metal shield.

Next strip and remove all wiring above and below the chassis—*with the exception of wiring associated with the low-voltage and high-voltage power supplies and the filament connections.* Use a soldering iron; don't cut wires! Some of them may be used later in rewiring the chassis.

The top portion of the steel front panel is sawed off on a horizontal line that will just clear the tops of the two highest controls when the knobs are in position.

At the bottom center of the steel front panel cut an opening suitable to accommodate a 5-inch PM speaker, and drill mounting holes.

A bakelite or wooden support bracket for the cathode-ray tube should be attached to the top of the large bakelite plate (just behind the steel front panel). Heavy felt or other cushioning material should be used on the top surface of this bracket, so that the tube rests securely.

The chassis is now ready to be rewired, according to the circuit diagram of Fig. 2 on page 8.

Use wire having adequate insulation for voltages likely to be encountered. If in doubt, use *heavier insulation!* For all high-voltage leads use ignition cable.

Always allow adequate spacing between adjacent wires, particularly in crowded parts of the receiver. All high-voltage circuits are wired in *above* the chassis.

Use a good grade of solder with rosin core for connections, avoiding cold-soldered joints. Most likely sources of later trouble and defective operation are; badly soldered and loose connections, insufficiently insulated wiring, and improperly shielded and bonded wiring.

C-R-T Control Circuits

First to be mounted and wired are the four variable controls used with the high-voltage circuit of the cathode-ray tube. These are the potentiometers controlling; *Horizontal Center-*

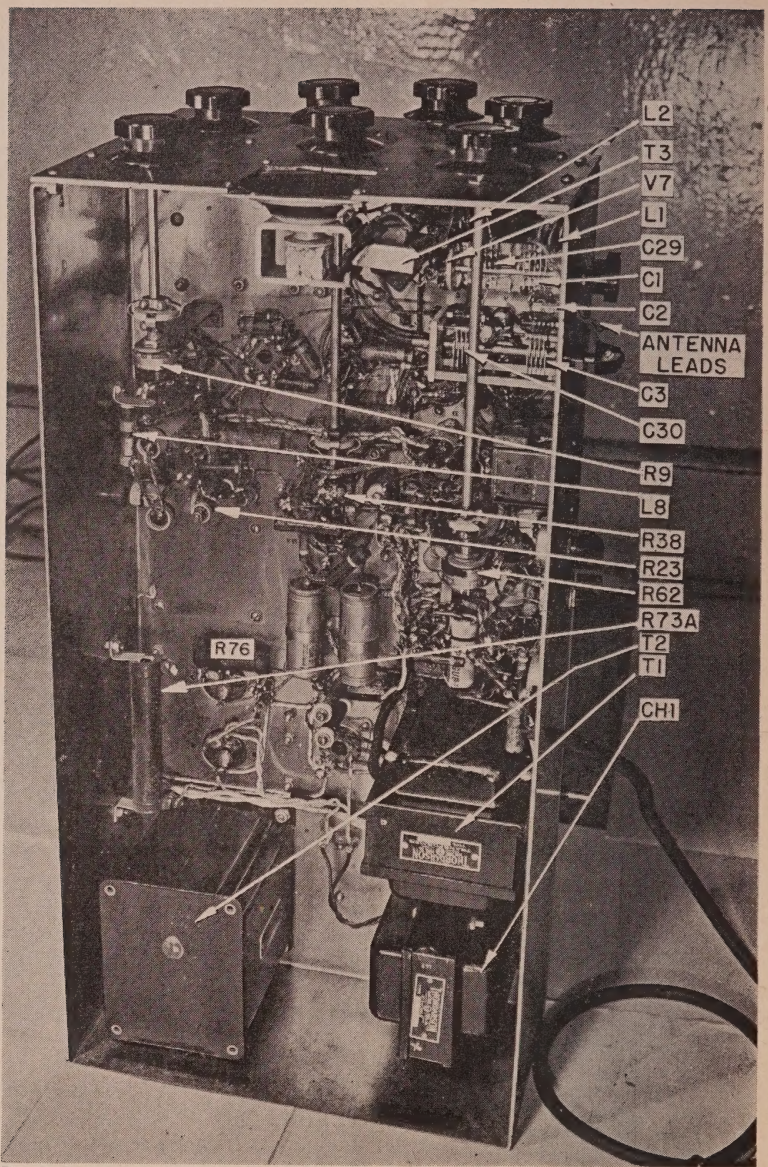


Fig. 3. Under-chassis view of completed receiver. Note that all components are grouped closely to form their respective stages. Sound trap, L_4 (not visible in the photo), is mounted directly under the tuning condensers, C_3, C_{30}.

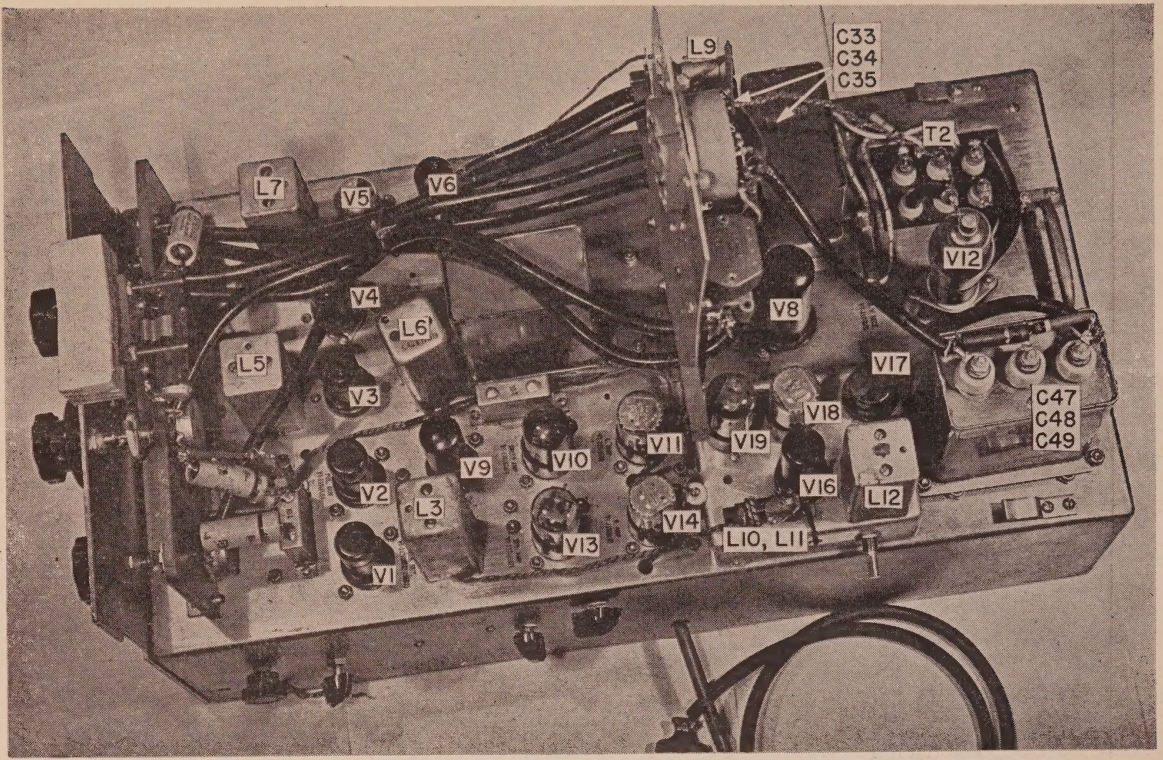


Fig. 4. Top view of completed television receiver, with cathode-ray tube removed. Note cushioned bracket for picture tube. High voltage units are toward rear of the chassis near the actual tube connections. The large, unidentified can, mounted in the center of the chassis, contains a bank of .1 μfd., 600 v. condensers.

ing, Vertical Centering, Focus, and *Intensity.*

Mounting holes for seven controls are already positioned in the steel front panel, and the upper four are now used to accommodate the proper potentiometers.

They are mounted behind the large bakelite plate, so that their shafts extend out and pass through the mounting holes in the front panel. These four high-voltage controls *must* be properly insulated from their shafts by means of insulated couplings (Fig. 1 and 3). Original knobs can then be replaced on the four protruding shafts.

Since the high-voltage circuits are wired in *above* the chassis the height of these four potentiometers makes their position ideal for all wiring. Select the proper values of associated resistors. and connect the high-voltage control circuits according to the circuit diagram.

Use ignition cable for all wiring. Make certain the proper size potentiometers are used for the four panel controls. Note that the resistance value of the *Intensity* control is 100,000 ohms.

Nomenclature of the original four controls (printed on the face of the steel front panel) should now correspond to the function of the new television controls.

C-R-T Amplifier Stages

Next to be connected are the *horizontal amplifier* and *vertical amplifier* stages which control the operation of the picture tube.

The two amplifiers are somewhat similar in design, each using a type 6SN7 tube in a stage of phase-inverting amplification and each performing a similar, though independent, function. Saw-tooth waves previously generated by the *horizontal oscillator* stage are amplified by the *horizontal amplifier* and then applied to the horizontal deflecting plates of the picture tube, causing the elctron beam to sweep horizontally across the face of the tube at a high frequency. Saw-tooth waves previously generated by the *vertical oscillator* stage pass through the *vertical amplifier* and are then applied to the vertical deflecting plates of the picture tube, causing the electron beam to sweep vertically at a lower frequency.

Mount the tubes for the *horizontal amplifier* and *vertical amplifier* close to the cathode-ray tube (Fig. 4). Then wire the two stages according to the circuit diagram.

Bias for the *horizontal amplifier* tube is obtained from the rectified grid current.

Couple the output of each amplifier through the 2500 w.v. condensers (mounted behind the cathode-ray tube base plate and socket), and then connect to appropriate deflecting plates of the picture tube.

C-R-T Oscillator Stages

The *horizontal oscillator* and *vertical oscillator* stages operate similarly but independently, each using a type 6N7 tube in a modified multivibrator arrangement to generate a saw-tooth voltage waveform. The *horizontal oscillator* provides a high-frequency wave which is coupled to the *horizontal amplifier* stage. The *vertical oscillator* provides a saw-tooth wave of lower frequency which is coupled to the *vertical amplifier* stage.

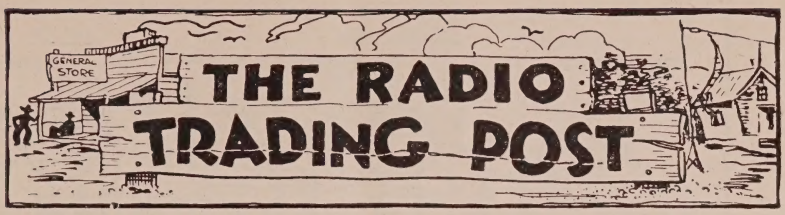
When free-running, each oscillator functions at a frequency determined by the resistance-capacitance balance in the grid and plate circuit. However, when sync pulses from a television transmitter are amplified (by the *sync amplifier* stage) and applied to the grid circuit of each oscillator, the multivibrator "locks" with the frequency of the incoming sync pulses.

In this manner the *horizontal oscillator* and *vertical oscillator* stages produce saw-tooth waves *in ratio to each other* and in frequency according to the incoming sync pulses from the *sync amplifier* stage.

Referring to the parts arrangement shown in Fig. 4, the *vertical oscillator* tube is placed in front of the *vertical amplifier* tube, and the *horizontal oscillator* tube is placed in front of the *horizontal amplifier* tube.

Wire the two oscillator circuits according to the circuit diagram, after proper controls have been mounted.

(Fig. 2 is on pages 8 and 9. **This article will be continued in next issue.)**



A Free Market-Place for Buyers, Sellers, and Swappers.

These advertisements are listed FREE of charge to C-D readers so if there is anything you would like to buy or sell, if you wish to obtain a position or if you have a position to offer to C-D readers, just send in your ad.

These columns are open only to those who have a legitimate WANTED, SELL, or SWAP proposition to offer. The Cornell-Dubilier Electric Corp. reserves the right to edit advertisements submitted, and to refuse to run any which may be considered unsuitable. We shall endeavor to restrict the ads to legitimate offers but cannot assume any responsibility for the transaction involved.

Please limit your ad to a maximum of 40 words, including name and address. Advertisements will be run as promptly as space limitations permit.

FOR SALE—1 United Motors tube tester, model 160, good condition, $10.00. 1 Triplett model 1213 tube tester, good condition $15.00. 1 Onan 110 volts A. C. light plant, 350 watts A-1 condition. Has only been used about 5 months, $75.00. Herman Allen, R. 5, Bedford, Indiana.

SELL OR TRADE—ATR Inverter 110 V DC to 110 V AC 350 W Int. 250 W cont Heavy duty model. Practically new; want Riders manuals, anyone from 1 to XIV. Novello Radio Co., 40 Cobden St., Roxbury 19, Mass.

FOR TRADE—1946 edition I. C. S. Radio Servicing Course for late edition N. R. I. course. Gilbert Watson 1008 Sansom Ave., Alabama City, Ala.

POSITION WANTED—Ex-Navy Electricians Mate 3/c. Would like position repairing, recalibrating, building, meters and instruments of all kinds. Have Navy experience in this line also some experience in radio and electronics. Neal E. Dickerhoof, P. O. Box 565, Des Moines, Iowa.

FOR SALE—Have 80 new G. E. 5U4G tubes in sealed cartons. Sell for 35c each in lots of 10 or 25c each for all. I. Susman, 1052 Blake Ave., Brooklyn 8, New York.

TRADE—Latest 1947 N.R.I. radio course including all 6 kit manuals for sets 1 to 20 of Howard W. Sams Photofact Folders. Folders must be in binder. All lessons are clean and in A-1 condition. Roy Musselwhite, P. O. Box No. 438, China Grove, N. C.

TRADE—Brand new Superior Signal Tracer, never used. Also $4 signal tracing book. Will trade for complete N. R. I. course. Jack Tressa, 56 Lackawanna Ave., Swoyerville, Pa.

TRADE—Practically new RCP model 660 Electronic Multitester—for cut-film camera, enlarger or dark room equipment. Stanley Radwanski, 1536 S. Spaulding Ave., Chicago, Illinois.

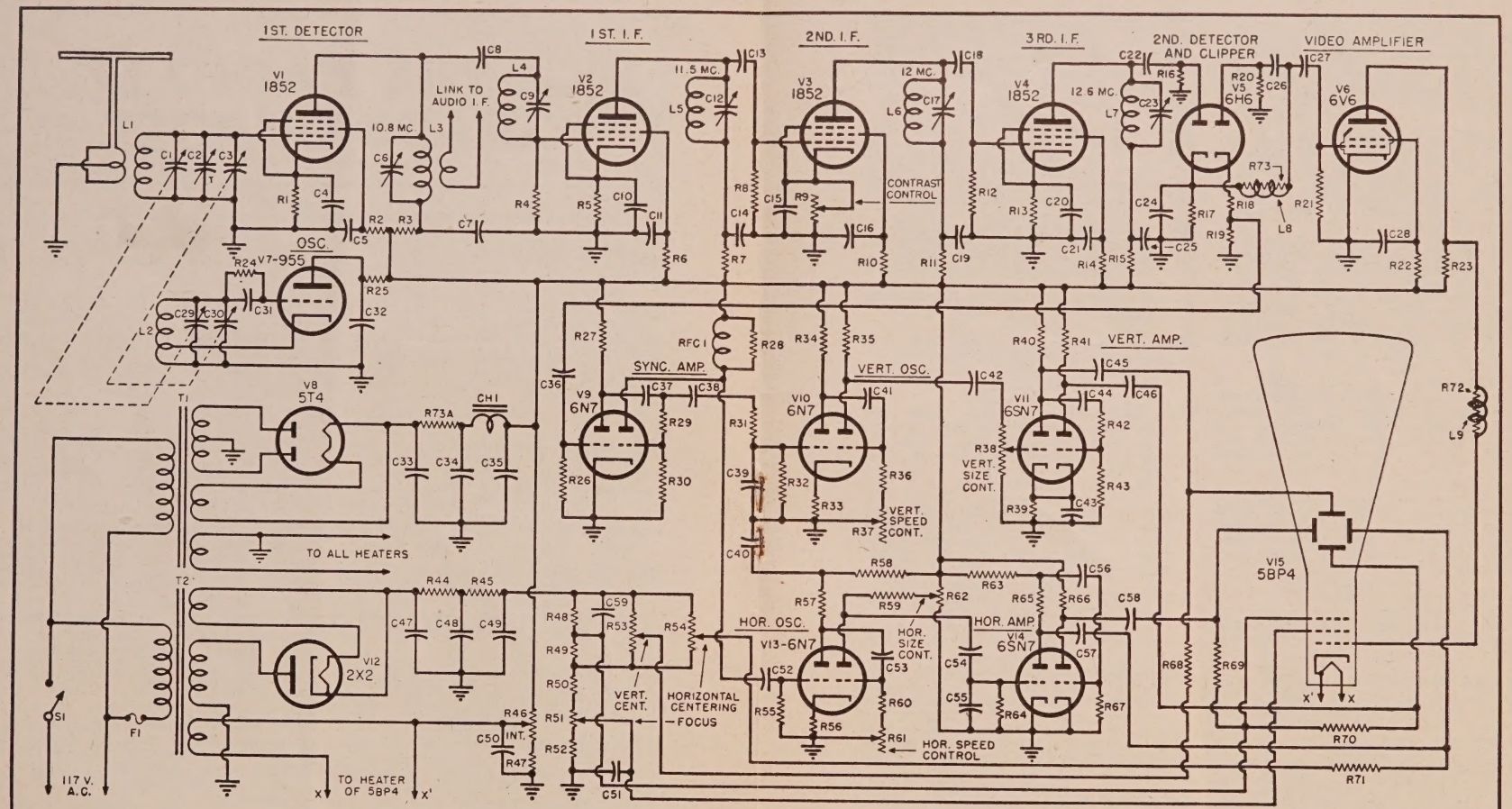
FOR SALE—New Philco UN 6-500 Auto Radio—used for demonstration. Lists for $79.00. Will sell outright or trade for Riders manuals or what have you? William J. Mescall, 410 23rd St., Union City, N. J.

FOR SALE—12-inch Majestic "Colotura" speaker, minus cone, for Models 130-A, 230-A, 60 and 160. 11-inch Atwater Kent, same condition. Pick up for $2 each at 26 Clifton Place, Brooklyn. Ehlers.

FOR SALE—One new N.R.I. Vacuum tube volt meter. Complete with 1C5GT/G tube, batteries and test probes. First fifteen dollars takes it. Roy Musselwhite, P. O. Box No. 438, China Grove, N. C.

FOR SALE OR TRADE—G. E. Unimeter, perfect condition, used 6 months, 0 to 1 megohm, 0 to 2500 volts DC and AC. 1 to 10 amps. Want good 3 or 4 tube signal tracer or small Halicrafters. All wave radio. Will sell for $25. Jesse Ramey, R-1 Leeson Ave., Cadillac, Mich.

(*Continued on page* 10.)



R_1, R_{38}, R_{66}—500 ohm, ½ w. res.
R_2, R_6, R_{10}, R_{14}, R_{22}, R_{47}—100,000 ohm, ½ w. res.
R_3, R_7, R_{11}, R_{15}—1000 ohm, ½ w. res.
R_4, R_8, R_{12}, R_{16}—2500 ohm, ½ w. res.
R_5, R_{13}—200 ohm, ½ w. res.
R_9—50,000 ohm pot. with sw.
R_{17}, R_{39}—4000 ohm, ½ w. res.
R_{18}—5000 ohm, ½ w. res.
R_{19}, R_{28}, R_{55}, R_{63}—2000 ohm, ½ w. res.
R_{20}, R_{32}, R_{67}, R_{69}, R_{71}—1 megohm, ½ w. res.
R_{21}, R_{34}, R_{35}, R_{36}, R_{40}, R_{41}, R_{45}, R_{50}, R_{59}—500,000 ohm, ½ w. res.
R_{23}—5000 ohm, 10 w. res.
R_{24}, R_{25}, R_{31}—20,000 ohm, ½ w. res.
R_{26}, R_{30}, R_{42}, R_{64}, R_{68}, R_{70}—2 megohm, ½ w. res.

R_{27}, R_{29}, R_{60}—10,000 ohm, ½ w. res.
R_{37}, R_{62}—500,000 ohm pot.
R_{61}—2 megohm pot.
R_{43}—60,000 ohm, ½ w. res.
R_{44}, R_{57}, R_{58}, R_{65}, R_{66}—50,000 ohm, ½ w. res.
R_{46}, R_{61}—100,000 ohm pot.
R_{48}, R_{49}, R_{52}—200,000 ohm, ½ w. res.
R_{51}, R_{53}, R_{54}—200,000 ohm pot.
R_{72}, R_{73}—.5 megohm 2 w. res. (See coil table)
R_{73A}—300 ohm, 50 w. res.
C_1, C_{29}—50 μμfd. variable cond.
C_2—2-plate trimmer (Comp. type)
C_3, C_{30}—10 μμfd. trimmer (Fine tuning cond.)
C_4, C_5, C_8, C_{10}, C_{11}, C_{12}, C_{15}, C_{16}, C_{18}, C_{20}, C_{21}, C_{22}, C_{32}, C_{41}, C_{54}—.01 μfd., 600 v. cond.
C_6, C_9, C_{12}, C_{17}, C_{23}—See text
C_7, C_{14}, C_{19}, C_{25}, C_{56}—.006 μfd., 600 v. cond.
C_{24}—25 μμfd. mica cond.

C_{26}, C_{27}, C_{28}, C_{36}, C_{37}, C_{38}, C_{39}, C_{40}, C_{42}, C_{43}, C_{44}, C_{50}, C_{51}, C_{59}—.1 μfd., 600 v. cond.
C_{31}—100 μμfd. temp. compensated cond.
C_{33}, C_{34}, C_{35}—8 μfd., 450 v. elec. cond.
C_{45}, C_{46}—.01 μfd., 2500 v. cond.
C_{47}, C_{48}, C_{49}—.1 μfd., 4000 v. cond.
C_{52}—100 μμfd. mica cond.
C_{53}, C_{58}—.001 μfd., 600 v. cond.
C_{57}, C_{58}—.002 μfd., 2500 v. cond.
L_1, L_2, L_3, L_4, L_5, L_6, L_7, L_8, L_9—See coil table
RFC_1—2½ mh. r.f. choke
S_1—S.p.s.t. sw. on R_9
F_1—110 v., 1 amp. fuse
CH_1—8 hy., 150 ma. filter choke
T_1—Power trans. 375-0-375 v. @ 150 ma.; 5 v. @ 2 amps.; 6.3 v. @ 8.5 amps.
T_2—Power trans. 2500 v. @ 10 ma.; 2.5 v. @ 1.75 amps.; 6.3 v. @ .6 amp.

Fig. 2. Complete schematic diagram of the video section of the home-built television receiver. The audio channel diagram for this receiver will be covered in next issue.

(*Continued from page 7.*)

FOR SALE—Electronic equipment, Rider's 1 to 8 Manuals, earphones, speakers, tubes, AC and DC meters, testprods, books and miscellaneous odds and ends. R. J. Clark, Newbridge Rd., Bellmore, N. Y.

FOR SALE OR TRADE—14 watt Hi-Fi amplifier, 7N7 triode amp., 7N7 push-pull amp., 2- 7C5's output, 5Y3 rect. Tone control, two input jacks, 12-in. PM speaker included for $36.00 or trade. Edwin C. Eisenbeis, 881 Fetter Ave., Louisville 4, Ky.

POSITION WANTED — Radio serviceman, 10 years experience, home; auto radio, record changers. Inside or outside work, Navy veteran, New York City and vicinity, driver's license, own tools, equipment. No reasonable offer refused. Harold Bachmeyer, 184 Essex St., Brooklyn 8, N. Y.

FOR SALE—Masco 25 watt amplifier, 6 volt or 110 volt operation 2-12-inch PM Speaker's Mike and Stand. This equipment has never been used since it was purchased. Will sell all for $150.00 and include 2, 5 ohm line transformers. Leo S. Stevens, 1220 Thaer Dr., Richlaid, Washington.

FOR SALE—One 1.50-inch. E. F. F:1.85 movie projector lens. Made by Simpson Instrument and Lens Corp. Price: $15.00. J. S. Lowe, 4509 White Ave., Baltimore 6, Md.

FOR SALE—Riders abridged 1 to 5 for $15.00; Riders Manuals, 3-4-5-6 at $10.00 each; 7, $13.00; 12-14, $13.00 each. Guaranteed tubes. Write for list. Goodwin Radio Shop, Rankin, Illinois.

FOR SALE OR TRADE—5 large gang tuning condensers in good shape. For trade, a code practice oscillator. Michael Vasko, 1529 Manhattan St., Youngstown, Ohio.

FOR SALE—Precision E-200 Signal Generator. Cost $62.87 a month ago. In new condition. Will sacrifice for $55.00, or trade for used S-20-R or SX-25. Will pay cash difference, if desired. Barry Windsor, 212 W. Jamison St., Flint 5, Michigan.

WILL TRADE—Astatic No. JT-30 Microphone, 2-Duotone ruby tip cutting needles, L. S. Starrett Speed Gauge, Royal Typewriter, radio books. Hichock No. 195 5-inch Oscilloscope, Dumont No. 208B and 274 5-inch Oscilloscope, R.C.A. No. 160 5-inch Oscilloscope, Sprague Delux Telohmike, Solar Capacitor Analyzer No. CBB-1-60 and CF-1-60, Jackson No. 650A Condenser Tester and Supreme No. 562 Audolyzer. James W. Simmons, 5626 Appletree Street, Philadelphia 39, Penna.

FOR SALE—BC-342-N 1.5 to 18 mc A. C. receiver, BC-314-F 200 to 1500 K. C. A. C. receiver, both complete. RCA headphones $2.69. LS-3 6-inch P.M. speakers in metal cabinets $3.50. Other surplus, free list. Malcolm E. Hughes, 4819 Euphrosine St., New Orleans, La.

FOR SALE OR TRADE—Traveling bag, alligator grain leather, like new. One ¼ h. p. compressor, 1 cyl., $3.50. Will trade for 5 tube super Midget radio or condenser tester, 200 mfd or better. W. F. Onder, Rt. 1, Box 330, Arnold, Mo.

FOR SALE—Brand new 6 tube AC/DC two band receivers, tune 550 to 1600 kc. and 6 to 16 mc. walnut cabinet, self contained aerial and RF stage, Alnico V spkr. In factory cartons, $26.95. Hyman's Radio, 561 Church St., Norfolk, Virginia.

FOR SALE—National 1-10 complete; Burton Battery powered test oscillator; Albert Webb, 1514 Chew Avenue, Philadelphia 41, Pennsylvania.

FOR SALE—Master Analyst, Model 504, manufactured by Radio City Products Company, New York City. Complete with plug and adapters. Never used. Cost $15. Best offer takes it. Stevens Radio Shop, Raymond N. H.

WANTED—"Radio Service Dealer" magazines for the years 1942, 1943, 1944, 1945 and 1946. Will pay cash for same. Theo. L. Sebold, 610 Eye St., N. W., Washington 1, D. C.

FOR SALE—32-volt D.C. motor. One horsepower, 1750 R.P.M. 27 amp. Run 10 hours. $25.00. Robert S. Schultz, 166 Gordon Place, Freeport, N. Y.

SERVICEMEN—Record Changer and Radio Chassis Repair Stand. Easy to use. Guaranteed to be unbreakable, made of steel and semi-steel. Will support any make or set or changer. Mailed to you postpaid at only $3.50. Hansen Brothers Co., 252 Grant Ave., Jersey City 5, N. J.

FOR SALE—2 new, unused Bliley Type VX-2 3105 kc. transmitting crystals — value $5.00 ea.—for best offer. Phil Mellusi, 41 Lewis Ave., Summit, New Jersey.

FOR SALE—$600 wholesale inventory of parts, equipment for $300. Send for inventory list. All inquiries acknowledged. Milo G. Burston, 320 Tawas St., Alpena 3, Michigan.

WANTED—Used short wave communications receiver. Preferably something similar to Hallicrafter's S-40A. State price and band coverage. G. C. Netherton, Jr., Rt. No. 4, Box 1384, Asheville, North Carolina.

FOR SALE OR TRADE — Signal tracer model 200, MFG by Precision Electronic Inc., Chicago, never has been used, bought two months ago, $29.95 plus 50c for instruction book. Was given one so won't need this signal tracer, sell to best offer or trade for 1/4 inch elec. drill in good shape with three wire cable and chuck key, all inquiries answered. Sweeney's Radio Service, 462 W. 7th St., Winona, Minnesota.

TRADE—Receiving tubes 6L6, 9002, 9003, 1H5GT, 1N5GT and many others in factory cartons, radio service books and machinists tools for good signal generator, V.T.V.M. or Riders Manuals. All inquiries answered. Angelo F. DiMuccio, Laurel Hill Ave., Bridgeton, R. I.

FOR SALE OR TRADE — Signal Tracer "Sparx" Model 905, $35.00; Signal Generator, Model A200, $45.00. Both not used, in original carton. Jackson cond. tester, Model 650a, $45.00. For printing press size 7 x 11 or 11 x 13. J. Jeka, 326 First St., Jersey City 2, N. J.

FOR SALE — Readrite model 432A tube tester, used very little guaranteed like new, tests octals, loctals, bantams, etc., $30.00, postpaid. Jack Marley, Bedford, Iowa.

FOR SALE—1 Amertran Filament Transformer, H-575, 2.5/4.0 volts at 15 Va. 10,000 volts insulation, $17.65; 2 C-D TJ-20080 filter condensers, 8 mfd. at 2,000 volts, $12.50 each; 4 803 transmitting tubes at $7.75 each; 1 1230 Superior Signal Generator, 100KC to 70 MC in perfect condition $28.95. Thos. F. Shambach, Jr., Middleburg, Pa.

FOR SALE—New tubes and parts from recently closed radio service shop. Dealer's net cost, $275. Will sell as one unit or in lots. State your needs. High-Tor Radio Center, 8 First St., Haverstraw, N. Y.

TRADE—10 Volume new Standard Encyclopedia for R.C.A. or Simpson Signal Generator. Must be in working condition. Books are in very good condition, 1942 edition. Roy's Service, R-2 Brigham City, Utah.

FOR SALE—New, never used Deluxe "Superstream" Model SC600 McElroy Transmitting Speed Key. Gerard E. Pelrin, 5 Popes Hill St., Dorchester 22, Mass.

WANTED—All tube testing information on the Triplett (model 1501) tube tester and set analizer. Will pay to borrow if necessary. J. B. Runyon, 39 Bedford Rd., Summit, N. J.

FOR SALE—Records, have 2,000 on hand, excellent condition. Many, but not all, are collector's items. Write for list. B. Altman, 14 Hicks St., Brooklyn, N. Y.

FOR SALE OR TRADE—Precision E200 Signal Generator used but little. Silver Vomax, model 900, never used, $47.50. Utah record changer and three tube amplifier, perfect, $25.00, cost, $45.30. Want cash, amplifiers or communications receiver. W. J. Phillips, Box 433, Belington, W. Va.

FOR SALE—Complete station, HQ120x receiver, 200 watt rack mounted phone transmitter, DC-221 Freq. meter, mike, phones, speaker, parts, $200. Write R. Bach, 21 W. Mosholu Pkwy., Bronx, New York.

FOR SALE—Supreme Audolyzer, $100.00, new; 1 McMurdo — "Vomax" — $50.00, new; 1 Monarch Sig. Gen. Make offer above $5.00. 1 Solar Quick Check Cap. Analyzer, offer; 2 Racon Paging Horns, 6U field. Asstd. spkrs. in Baffles for P.A. work. 35 watt amp. 50 watt amp. Sell any or all. Answer all queries. Robert O. Willis, 608 S. Douglas St., Pinckneyville, Ill.

FOR SALE OR TRADE—Three (3) Spalding tennis rackets, gut strung, new condition. Want photographic books, equipment. Write for description. John J. Vilkas, 1510 So. 49th Avenue, Cicero 50, Illinois.

FOR SALE—Complete radio service equipment, parts, tubes, and hardware, val. $1,000, will sell complete for $300.00, shipping charges not prepaid. (Wt. about 150 lb.) Half with order, balance C.O.D. Edward C. Punt, 397 Melrose St., Brooklyn 6, N. Y.

SELL OR TRADE—American Electricians Handbook by Croft; Hawkins Electrical Guide (10 vols); Library of Practical Electricity by Croft (8 vols). Excellent condition—all letters answered. What have you? A. Brackmann, 223 East 96th Street, New York City 28, N. Y.

WANTED—Diagram with value of components and/or Handbook for Utah transmitter type UTA5-10-20. Will pay any reasonable price. Please contact E. Hanlon, c/o Eastern Airlines, Hanger No 8, communications, LaGuardia Airport, New York.

FOR SALE—Hallicrafters S-20-R receiver $45. F.M. exciter unit—circuit as shown Nov., 1946 Q.S.T.—$20. Power supply 1000 V. $15. L. Didsbury, 1841 North Ave., Bridgeport, Conn.

FOR SALE—Williard storage batteries, model 20-2, 2 volt., 20 A.H., plastic, non-spill, built in hydrometer. Replacement for early G.E. portable. Many other uses. $2.50. Shipped dry. R. Altschuler, 1821 Prospect Ave., New York 57, N. Y.

FOR SALE OR TRADE—Medium Voltage Power Transformers, 14144 kc. Peterson X-tal, Hand Key, Bug, Miscellaneous used tubes. Interested in VHF and also in components for quarter kilowatt phone rig. Charles R. Ammerman, 502 W. Beaver Ave., State College, Pa.

WANTED—Wire recorder capable of recording 2 hours or more. State make, condition and price desired. Or will trade for Hallicrafters Model 40-S wave set almost new. Ira Rothenberg, Box 1, Little Neck, N. Y.

WANTED—Aerovox L. C. Checker, Model 95 or similar Checker, also A.R.R. Receiver, frequency range 28 Mc. to 145 Mc. Charles Sackermann, 649 Thirty-eighth Street, Union City, N. J.

FOR SALE OR TRADE—Model S.G.-43 sig. gen. 7 bands 100kc-90mc.—$35. Philco car set 6 tu.—$15. Philco-112, 10 tu.—$20. Philco 20, 5 tu. table model—$10. Packard Bell model 5AC, no cab. 5 tubes—$15. RCA, 5 tu.; ac-dc no cab. —$15. RCA model 80, 9 tubes—$25. New Products pre-war model record-changer-recorder (Mag.)—$25. Terms: All prices quoted are FOB Los Angeles. COD orders accepted if 50 % with order. Plus charges. Fred Dillion, 1630 N. La Brea Ave., Los Angeles, 28, Calif.

TRADE—New, perfect binocular, Universal, 6 x 30, complete with leather case, for communication receiver, in good condition. Will answer all communications. A. A. Goldberg, 2151A Virgil Place, New York 61, N. Y.

FOR SALE—Portable tube tester—Confidence model B. A-1 condition. First $20.00 Money Order takes it. Shipped express collect. G. Brause. 351—27th St. San Francisco 14, Calif.

FOR SALE—Slide Rule Short Cuts, with Positive Location of the Decimal Point. Easier, quicker AC-DC calculations. No other slide rule text like it. Second edition, $1.50 postpaid. W. P. Miller, 536 "F" St., San Diego 1, Calif.

FOR SALE—Wireless Oscillator, new—uses 12SA7 and 35Z5 tubes. Neatly designed. $5.00 complete with tubes. Also have 2 and 3 tube amplifiers, new—using (12SQ7) 50L6 and 35Z5 tubes. Priced low. Send for list. Leo Strollo, 147 Linden Street, Brooklyn 21, N. Y.

FOR SALE—Hickok Tube Tester model No. 530. Handles tubes with all filament voltages including 117 and all bases including miniature—$40.00. Weston Analyzer model 665—$25. Both instruments perfect. Cash or trade for good miniature or reflex camera—no junk. H. L. Wilson, 307 Third Ave., McRae, Ga.

FOR SALE—Triplett 666H V-O-M, new, $18.50; Antenna A-62 (Phanton) 50c; tubes. Will send list. $4.00. Ansco folding camera, 2¼ x 4½, 9 stops, focal 7.5, leather case, $15. Leo L. Bogdanor, 2684 Merced St., Los Angeles 31, Calif.

FOR SALE—R.C.A. 160-B "5 scope, new, never used, Supreme 502 analyzer, good condition, Jewell 144 analyzer, Rider manuals: II, III, XII and others. Record changer manual in new condition, all for $250.00. Also tubes, parts, vibrators, text books, magazines and many other parts. State your needs. Albert B. Corideo, 51 Ridgefield Ave., Waterbury 45, Conn.

FOR SALE—Supreme Model 585 deluxe diagnometer in good working condition. $50. George B. White, 345 Park Ave., Worcester 2, Mass.

FOR SALE—1946 Cushman Stape Rack Scooter, just like new. It is good for pick-up. $300.00. Lindy's, 701 E. Eighth Street, Coffeyville, Kansas.

FOR SALE—Modern and out-of-date tubes below list price. Free list. Belltone Radio B4, 167-04 111th Ave., Jamaica 5, New York.

FOR SALE—R.C.A. 4 tube receiver, model R17M, metal cabinet, table model, 110 Volt. R.C.A. 8 tube receiver, model R7, no cabinet. Silvertone, 4 tube, 6 volt receiver, model 4521, wood cabinet. Other parts. Eastman Kodak. Want good V.O.M. with full instructions or an offer. John S. Chanin, P.O. Box 241, Benzonia, Michigan.

FOR SALE—14-6SN7 Sylvania, new, uncartoned, 95c each; 7-6H6 Sylvania, new, uncartoned, 80c each. 1 Moviematio model 300 camera; takes snapshots, moviebooks or movies; never used; make offer. 1 Varitian model V-1M, $22.50. Jay Hilyerd, Rt. 6, P. O. Box 46, Delaware, N. J.

FOR SALE OR TRADE—Complete Radio Television Institute course with lab reports, 1936 and 1937 RCA Service Notes, German office typewriter and Minox camera, both in excellent condition. Best offer or will trade for test or camera equipment. Eric W. Wolf, 896 First Ave., New York 22, N. Y.

FOR SALE—Tubes, standard brands, 60% off list, any type, radio parts, kits. List sent on request. Technical Radio Lab., 341 Wilson Ave., Brooklyn 21, New York.

FOR SALE—Fully stocked and equipped radio and appliance repair business, for information and price, write Fred's Radio and Electric Service, 211½ Haledon Ave., Paterson 2, N. J.

FOR SALE—Direct-reading Frequency Deviation Meter, 900-1000-1100 CPS, Weston Model 500 in perfect condition, $45.00 (new, price $100.00) complete. Excellent for Standards or station use. E. L. Sachs, 119-20 Union Turnpike, Kew Gardens, N. Y.

FOR SALE—One Amperite PGH Mike, one G.I. single speed recording and playback turntable, and one Masco floor type mike stand with flexible gooseneck. Best cash offer accepted. Clarence Pearson, Reynolds, Ill.

FOR SALE OR TRADE — Transmitting tubes, type 833A and 575A, very good condition and reasonable, or trade a pair for a high voltage power supply. Also, German Luger for sale. Excellent condition. R. D. Chandler, 812 9th Ave., N. E., Minot, North Dakota.

FOR SALE—Combination tube and set tester, R.C.P. model 805, $59.50. Brand new, was never used. Instructions included. Hirsh, 145A B 26 St., Wavecrest, L. I., N. Y.

WANTED—Two 0-300 MA. milliammeters and one 0-1,000 volts voltmeter, both for D.C., used, but good condition. To be sent via Railway Express Agency Inc., charges collect. Write E. C. de Ugarriza, Ingenio Jobabo, Oriente, Cuba.

FOR SALE — Sprague Telemike—used 6 mo., paid $50. Will ship COD, $35.00. A1 condition. Supreme Radio Service, 103 N. 3rd St., Marshall, Minnesota.

FOR SALE—New tubes in original cartons, 50 % off list price, new but uncartoned. List upon request. B. Nelson, 42 Chelsea, Everett 49, Mass.

FOR SALE—One good electric clock, 110-120 volts, 60 cps., at $10.00. Terms: Cash, M. O. or Check. Will then send C.O.D. Evan H. Griffiths, R-D-I, Rock Creek, Ohio.

WANTED—One good portable or light desk typewriter. Evan H. Griffiths, R-D-I, Rock Creek, Ohio.

FOR SALE—One 14 tube communication receiver, 5 to 550 meters, no cabinet but good condition. Constructed from Meisner Kit No. 7502. One model 1240 Superior tube checker, good condition; make best offer. E. S. Barnett, Republican Grove, Va.

FOR TRADE—I have a Zenith Cobra Demonstrator in good condition. Want good quality phono and speaker equipment, perhaps 18" spkr. Will answer all inquiries. Chas. McCleskey Radio Co., 552 Cornell Ave., Baton Rouge 14, La.

RADIO TRANSMITTER AND RECEIVER—22watt Kaar Transmitter, new condition, using 4 HY69 tubes, Dynamotor power for 6 volt operation. 9 tube Karadio receiver in excellent condition, both receiver and transmitter 2 to 3 MC band, excellent for Marine use. $150 for both. Graham's Radio Service, North Third St., Fernandina, Fla.

FOR SALE—Hickok Model 534 Tube Tester, $100.00. Hickok 288X Signal Generator, also $100.00. Meisner Analyst used but in good condition, $50. George D. Fowle, Box 34, Springhouse, Penna.

WANTED—Rider Manuals Volume One to Eight inclusive, also Clough-Brengle Frequency Modulator Model No. 111. State condition and price, cash. The Radio Shop, 551A Dartmouth St., So. Dartmouth, Mass.

FOR SALE — Service bench and test panel completely wired. Also Model 18 Hickok signal generator and 6 volt power pack for auto radio service. For full details write to Sid's Radio Service, 49 Christie Ave., Clifton, N. J.

FOR SALE—Professional broadcast studio mixer. Ten 50 ohm and two Hi-Z inputs. Two balanced line channels. Either channel can be used for 500 ohm line or P.A. Original price $1,000 net. $500 takes it. J. Bradley, 430 Harvard, Ontario, California.

FOR SALE—18-tube, 6-band Midwest Receiver with 12-inch Utah speaker, 4.6-857 meters. Good condition. Will accept Vibroplex Speed Key, featherweight xtal phones and/or cash. H. Lulli, 2352 27th St., Long Island City 5, N. Y.

FOR SALE OR TRADE—1 Superior multimeter, pushbutton, condensers; 1 Superior S.G., 1 Supreme 589, and 1 Supreme 582 Audolyzer; 1 Wittie heater, Zephyr heating pads, small, portable electric heaters. Want Hickok 305. Star Radio, 276 Washington St., Perth Amboy, N. J.

FOR SALE OR TRADE—Industrial instruments: Resistance and Conductivity Bridge, Model RC-1, measures resistance from .2 to 250,000 ohms. Uses 606, 6E5 and IV tubes. Will sell for $25.00 cash or trade for the equivalent in photographic equipment or what have you. John Soger, 6 Pine St., Little Falls, N. Y.

WANTED—Technical information or manual on CW-46196 UHF receiver unit of ZBX aircraft radio equipment, also TM11-235 (SCR-536A) manual; 10TVL and 10HDVL coils; Hammerlund N-20 neutralizing condenser or equivalent. Sell "1-10" receiver, $14.00. Bill Benner, 145 So. Maple, Webster Groves 19, Mo.

FOR SALE—Hallicrafters 15 tube receiver, SX-28; 550 KC—42 MC including matching Hallicrafters — Jensen bass-reflex cabinet with 12" speaker. Excellent electrical and mechanical condition. $200.00 F.O.B. Otto Pollei, Jr., 2122 Edgeland Ave., Louisville, Kentucky.

FOR SALE OR TRADE—1 3"-R.C.A. Scope. 1-R.C.A. Signal Generator (Battery). Volumes 1 to 7 inclusive, Riders. Merle Hicks, Rowley, Iowa.

FOR SALE—Complete shop equipment: Supreme 599-A tube and set tester, Standard signal tracer 101, stock of tubes, replacement parts. Bench and cabinet. Samms folders, several used radios. Everything goes. Information upon request. Carl Colip, Jr., Charlottesville, Ind.

WANTED—An automatic code practice machine with tape. Please state condition and price. Ernest R. Peltier, 77 No. Cherry St., Apt. 3, Galesburg, Ill.

FOR SALE—Solar Condenser Analyzer, Model CC 160, $25. Triplett Model 1232 Signal Generator, $25. Triplett Twin Meter VOM tester, $20. Superior Almeter VOM and capacity tester A.C. operated, $15.00. Portable phone, 3 tubes, 6" speakers, $20. 5-tube 1½ volt table model set. Works like new, $15.00. Thomas Radio Service, Triumph, Minn.

FOR SALE—Meissner 3-tube battery regenerative receiver, 17 to 545 meters, complete with tubes. Excellent condition. $12.00 F.O.B. Otto Pollei, Jr., 2122 Edgeland Ave., Louisville, Kentucky.

RADIOFILE indexes, all material in ten radio magazines. Revised index issued monthly covers everything published from January to date. Year's subscription $1.00. Complete 1946 index 35c. Sample copy on request. Richard Dorf, 255 West 84th Street, New York City.

FOR SALE—350 cartoned tubes. Condensers, vibrators, resistors, volume control kit, etc. Also Day Rod tube and voltage tester. Vernon Pearson, 714 2nd Ave., Devils Lake, N. D.

FOR SALE—Hallicrafters, SX-17 Receiver (crystal), $50. AN/ARC-5 Broadcast Receiver, $13. Leica "E" Camera, excellent, Photo Film. Paper, Chemicals. Walter Lund, 125 W. 90 St., New York 24, N. Y.

FOR SALE — SX28A, perfect condition with speaker. Have D.C. here. Will trade for a good AC-DC receiver—balance in cash. Best offer takes it. All replies answered 100%. Wakze-Dominic Tinnerello, 238 East 123rd St., New York City, 35, N. Y.

FOR SALE—Dumont 208 C. R. Osscilloscope, $175.00, F.O.B., N.Y.C. Ferris R.F. Sig. Generator, model 22B, 85KC to 40M.C. Cal. in micro volts, $350.00, F.O.B. N.Y.C. 60 MFD-300 volt Acrovox condenser. Plug in octal socket, 50c each, F.O.B. N.Y.C. The Sterling Electronic Labs., 151 East 70th St., New York City 21.

FOR SALE—Victor model 60, 16mm sound projector, complete, $450.00 C.O.D. Frank Sikonski. 87 Samoset Ave., Central Falls, R. I.

WANTED—One 25A7 gt. Send price and condition of tube. W. W. Harris, 744 Johnson St., Vicksburg, Miss.

WANTED: BTVM, Hickok 203 or comparable quality. H. D. Wieck, 2213 Payne St., Louisville 6, Ky.

FOR SALE—Tubes, 35c, 25c and $2.20 each. C.O.D. C. W. Cassel, R. No. 4, Irwin, Pa.

REQUEST—Copy of catalog No. 195A. I am planing to rebuild and modernize my station and get back on the air after 6 years in the U. S. Navy. L. W. Wheatley, 1325 Skyline Dr., Fullerton, California.

FOR SALE—Spartan table model; Motorola car radio; Eastman 3A folding camera; Underwood No. 5 typewriter; electric hair clippers and other items. Want precision signal generator, VTVM. Glenn Watt, Chanute, Kansas.

FOR SALE—813—$5.00; 811—$1.50; variable condensers, hi-volt micas, vernier dials. Ask for complete list. H. W. Lawson, 204 Veterans Place, Ithaca, N. Y.

FOR SALE — Hallicrafters SX-9, $50.00; Howard 437, $45.00; Supreme 589 tube-tester, $45.00; Pierson-DeLane PR-15 receiver and speaker, $100.00. Wanted—Rider Manuals. Carl B. Evans, Box 312, Concord, N. H.

WANTED—Transmitter parts. Must be in good condition. State manufacturers number, condition, price and quantity. Eddie Howell, 501 W. Harden, Graham, N. C.

FOR SALE—Motorola auto radios, models 405, 505,605,705. Immediate delivery. Custom head matches car dash. Louis Mingace, 308A Watertown St., Newton 58, Mass.

FOR SALE—Home-built, P. A. system, 25-watt output, microphone, extension speaker, 12 inch. Another speaker built into PA case, phono turntable with pickup on top, 4-mike input, in excellent condition. Will sell for $75.00 complete Bill Hagara, P. O. Box 224, Slickville, Penna.

FOR SALE—Portable Supreme analyzer No. 502, D.C. or A.C. volts 0-1400, ohms 0-20 meg. De Arsnol meter, price $15.00 plus shipping charges. Lyle's Radio Service, 61-09 77th St., Elmhurst, L. I., N. Y.

FOR SALE—Triumph oscilloscope, perfect condition. Three-inch tube, built in Wobbulator and all the other features of other scopes. $60.00. Radio Communication Service, 4475 Myrtle Street, San Diego 5, California.

FOR SALE—Table model radios, AC DC chassis. All popular standard makes. Send stamp for list and description. Louis A. Goldstone, 1279 Sheridan Ave., Bronx 56, New York.

FOR SALE—Riders Manuals 1, 2, 3, 4, 5 and 6, $45.00. Gernsback Manuals 1, 2, and 3, $10.50. All complete and in good condition, no pages missing. C. R. Ciesicki, 4010 E. 153 St., Cleveland 5, Ohio.

FOR SALE OR TRADE—Condensor enlarger, imported. Has two lenses, semi-autofocus, extra long upright. Make offer, or trade for Hickok 288X signal generator. H. D. Wieck, 2213 Payne St., Louisville 6, Ky.

SELL OR TRADE—Foreign tubes. W20BH, 112 Delaware Ave., Long Beach, N. Y.

FOR SALE OR TRADE—1 Triplett milliammeter, 1 Readright ammeter, 1 Triplett ammeter, 1 doz. binding posts, 1 mahogany instrument case. Want standard-make, fil. transformer, standard-make, single, record player. Must be in perfect condition. R. C. Wilmarth, P. O. Box, 368, La Mesa, Calif.

FOR SALE—Good, used A.C. motors, $14.00, $15.00; capacitor analyzer, $55.00; custom fit, 1936, Pontiac, auto radio; custom fit, 1937, Ford, auto radio, $35.00 each. Paul Capito, 637 W. 21 St., Erie, Pa.

FOR SALE OR TRADE—Complete radio repair shop equipment. Parts, tubes and hardware, in good condition. Valued at $1800; will sell for $200.00 cash or will trade for a 13 x 19 job printing press. Write Edward C. Punt, 397 Melrose St., Brooklyn 6, N. Y.

POSITION WANTED—Desire a position in radio. Was chief radar operator in Army for three years. Am a graduate of two radio schools and have a radio-telephone second class license. Louis C. Cadieux, 6046 Linnden Ave., Long Beach 5, Calif.

FOR SALE OR TRADE—Standard-make signal generator; 5 pc. drafting set, triangles, tee square, scales; four-string Vega tenor banjo with resonator. Make an offer; I. Herman, 29 Gallatin St., N. W. Wash. 11, D. C.

FOR SALE—Raytheon transformer; two, jumbo, 4-pin tube sockets. $5. O. L. Updike, Thornton Hall, U. Va., Charlottesville, Va.

FOR SALE—Triplett, model 2405, volt-ohm mil-ammeter, 25,000 ohms per volt, $45.00. D. S. Overton, Pine Lake, R.D. No. 1, Paterson, N. J.

WANTED—Books and courses in electrical and radio engineering. State copyright date, price and publisher. Stanley T. Galaski, 223 54th St., Brooklyn 20, N. Y.

TRADE—100 Pocket-size, detective books for a record changer in working condition without case or amplifier. John Leuck, 1419 Rowland St., Bronx, N. Y.

WANTED—R.C.A. portable. Need not be in working order; need case and chassis. Will trade tubes, other radio items or cash. G. Jamkofsky, 527 Bedford Ave., Brooklyn 11, N. Y.

WANTED—Television set or kit, short-wave receiver, camera. Sell or trade: tubes, guaranteed. Other electronic material at equally low prices. Gershe, 147 Chester St., Brooklyn 12, N. Y.

FOR SALE OR TRADE—Two sets "Robot" lenses by Carl Zeiss Jena; both variable diaphragm and distances for money or radio test equipment. M. Archambault, 7745 Boulevard, St Michel, Montreal.

POSITION WANTED — as assistant or junior repairman in radio shop. Had some experience. Am advanced student of National Radio Institute. Cleveland Driggers, R.F.D. 1, Lee, Florida.

FOR SALE—Rubber stamps: 3-line cushion, index, not over 2 inches long, 65c. Extra lines, 15c each. Add 10c per inch per line for longer stamps. Or trade above stamp for radio parts, etc. Details 3c. Cookson, Box O, Puxico, Mo.

FOR SALE—Back issues of Radio News, Q.S.T., Radio World, Radio Craft, Service, Radio Television, Radio Service Dealer, Shortwave Craft. 10c per copy. Joseph Shack, 329 S. Racine Ave., Chicago, Ill.

FOR SALE—Supreme 599A tube and set tester; Supreme 581 signal generator and frequency modulator. Both for $100.00. Skyway Radio, 15 Tuxedo Ave., New Hyde Park, N. Y.

FOR SALE—R.C.A. TT5 television set. $100.00. A1 condition. Jack's Radio Service, 296 Wainwright St., Newark, N. J.

WANTED—One RME69 or HQ129 cabinet or its equivalent in size. B. B. Lawrence Norcross, 42 Laurel Ave., Linwood, N. J.

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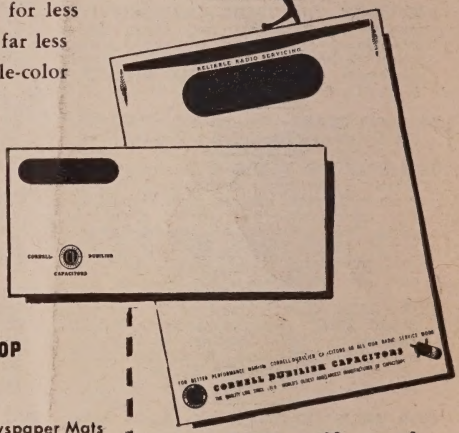

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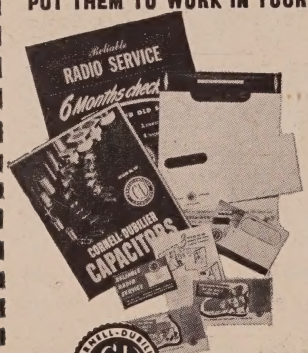

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